CLAIMS

1. A mass transfer column comprising:

an external shell defining an open internal region;

at least one return contact tray and at least one overlying centrifugal contact tray positioned in an alternating and vertically spaced apart relationship within the open internal region,

said return contact tray comprising a tray deck having at least one opening for removing liquid from an upper surface of said return tray deck and a plurality of vapor passages for allowing vapor to flow upwardly through said return tray deck to interact with liquid on said upper surface of said return tray deck,

said centrifugal contact tray comprising a tray deck having an upper surface, a periphery and a plurality of vapor passages for allowing vapor to flow upwardly through said centrifugal tray deck to interact with liquid on said upper surface of said centrifugal tray deck;

at least one center downcomer extending downwardly at said opening in said return tray deck, said center downcomer having a lower discharge outlet;

at least one annular downcomer extending downwardly at said periphery of said centrifugal contact tray deck and having a lower discharge outlet spaced above said return tray deck for feeding said liquid onto said return tray deck; and

a plurality of baffles extending upwardly from said return contact tray at said center downcomer and supporting said overlying centrifugal contact tray.

2. The mass transfer column of claim 1, wherein said center downcomer has an inlet wall and said baffles each have a lower end coupled with said inlet wall and an upper end.

3. The mass transfer column of claim 2, further comprising:

a pair of support beams that extend horizontally in a parallel relationship on opposite sides of the center downcomer below the return tray deck and are secured to portions of said inlet wall of the center downcomer, each beam having opposite ends supported by said column shell.

4. The mass transfer column of claim 3, further comprising:

a first support ring extending around at least a portion of said column shell and wherein said support beams are secured at said opposite ends to said first support ring.

5. The mass transfer column of claim 4, wherein said support beams are formed as an integral part of the return contact.

6. The mass transfer column of claim 4, wherein said first support ring is an expansion ring.

7. The mass transfer column of claim 6, wherein said expansion ring is supported by one or more supports that interconnect with the expansion ring and an adjacent support ring secured to the column shell.

8. The mass transfer column of claim 4, further comprising:

a second support ring that carries a plurality of circumferentially spaced bolting clips that extend radially inwardly from said second support ring and are secured to said annular downcomer.

9. The mass transfer column of claim 8, including a center support plate secured to and in underlying contact with said centrifugal tray deck of the overlying centrifugal contact tray.

10. The mass transfer column of claim 9, wherein said second support ring is an expansion ring.

11. The mass transfer column of claim 10, wherein said expansion ring is supported by one or more supports that interconnect with the expansion ring and an adjacent support ring secured to the column shell.

12. The mass transfer column of claim 1, wherein said baffles extend radially outward from a center vertical axis of the center downcomer.

13. The mass transfer column of claim 12, wherein said baffles are planar.

14. The mass transfer column of claim 13, wherein said baffles span said center downcomer.

15. The mass transfer column of claim 15, wherein said lower ends of said baffles have a greater horizontal dimension than the upper ends of said baffles.

16. A method of supporting at least one return contact tray and at least one centrifugal contact tray having tray decks with a plurality of vapor passages, at least one center downcomer and at least one annular downcomer in a mass transfer column, the method comprising:

(a) positioning said at least one return contact tray and said at least one centrifugal contact tray in an alternating and vertically spaced apart relationship;

(b) extending a plurality of baffles upwardly from said at least one return contact tray, each of said baffles having an upper end and a lower end;

(c) positioning a center support plate underneath and in contact with said centrifugal contact tray deck; and

(d) securing said upper ends of said baffles to said center support plate;

17. The method of claim 16, further comprising:

placing a pair of support beams below said return contact tray, each beam having a first and second end.

18. The method of claim 17, further comprising:

securing said first ends of said support beams to said center downcomer.

19. The method of claim 18, further comprising:

extending a fist support ring around at least a portion of the column shell.

20. The method of claim 18, further comprising:

securing said second ends of said support beams to said first support ring.

21. The method of claim 20, further comprising:

extending a second support ring around at least a portion of the column shell.

22. The method of claim 21, further comprising:

securing said annular downcomer to bolting clips of said second support ring.

23. The method of claim 16, further comprising:

securing said lower ends of said baffles to said return contact tray.